SAVE GRAIN BY *Treating Seed!*

FACT SHEET

U. S. DEPARTMENT OF AGRICULTURE
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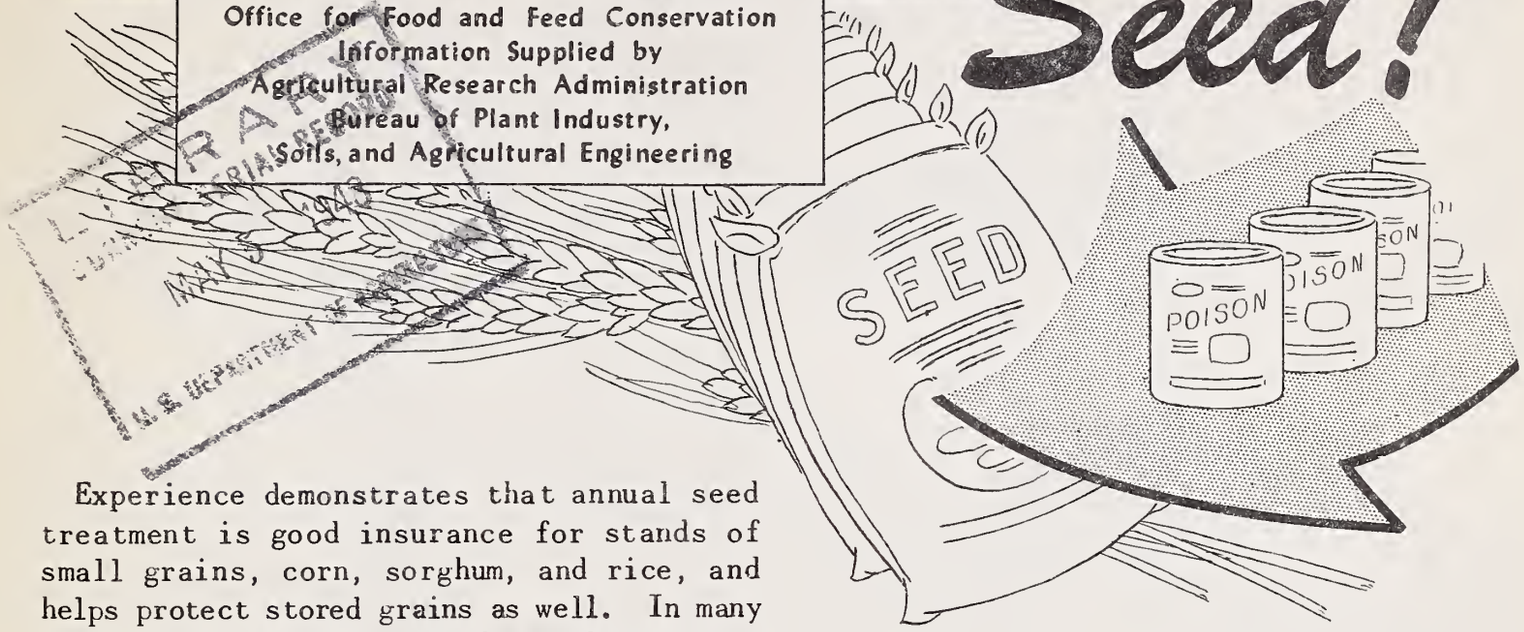

Experience demonstrates that annual seed treatment is good insurance for stands of small grains, corn, sorghum, and rice, and helps protect stored grains as well. In many cases, seed is treated by the seedsman or at the elevator before it is put on the market. When this has not been done, however, a grower will find it to his advantage to treat the seed himself. An ounce of fungicide may be worth hundreds of pounds of grain. Seed treatment gives these four benefits:

1. It destroys seed-borne fungi that cause plant disease.
2. It checks soil-infesting fungi that rot the seed or kill the seedling.
3. It helps control weeds by establishing a better stand of grain.
4. It increases the value of the harvest by helping to eliminate diseases which mar the appearance of grain.

The cost of seed treatment varies with the cost of material, rate of application per bushel, and the amount of seed used per acre. It may range from about 1½ to 20 cents per bushel, and from ½ to 15 cents per acre.

Factory-made equipment for seed treatment is on the market, but home-made devices are used effectively.

The fact that seed looks clean or comes from an apparently disease-free crop is no guarantee that it is free from infection. Spores of smuts and other diseases may be carried from nearby fields and may lodge beneath the hulls of oats and barley and in the creases of wheat kernels where they cannot readily be observed.

One of the greatest benefits of seed treatment is the control of fungi or bacteria that cause primary infection lesions from which the disease spreads to the leaves of other plants--leaf blotch in oats, net blotch and spot blotch in barley, bacterial stripe in sorghum. The spread of diseases such as these by secondary infection may cause heavy losses even though only a very low percentage of the seed sown was infected.

RECOMMENDED FUNGICIDES

The organic mercurials have proved more effective in cereal disease control than any other class of fungicide. Among these are: New Improved Ceresan (5% ethyl mercury phosphate); Semesan Jr. (1% ethyl mercury phosphate); Ceresan M (7.7% ethyl mercury p-toluene sulfonanilide), and Barbak C (8% mercury phenyl cyanamide).

Prominent among the non-mercurial organics are: Arasan (tetramethyl thiuram disulfide); Spergon (tetrachlorobenzoquinone), and Phygon (dichloronaphthoquinone).

Among the copper and zinc compounds which may be used to control certain seed-borne diseases are: copper carbonate, basic copper sulfate, and Dow 9B, (Zinc trichlorophenate).

CAUTIONS--All compounds used for treating seed are poisonous. Seed-treating operations should be carried on out-of-doors and precautions should be taken to prevent breathing the dusts. Treated seed should either be colored or placed in colored bags plainly labeled and never stored or mixed with seed which may be used for food or stock feed. Vessels used in handling dusts and treated seed and clothing worn by the operators of the equipment should be thoroughly cleaned before storage or re-use. Residue of poison should be buried.

CONTROL METHODS

Wheat. Bunt or stinking smut is the most widespread wheat disease controlled by seed treatment. When the soil is not infested, dusts such as copper carbonate or basic copper sulfate applied at the rate of 2 ounces per bushel will readily control the disease. New Improved Ceresan applied at the rate of only ½ ounce per bushel controls bunt and a number of other seed-borne diseases such as black chaff, basal glume rot, and various seedling blights. Somewhat more expensive, Spergon and Arasan will control bunt when applied at the rate of 2 ounces per bushel. Treatment of seed wheat will not prevent diseases caused by air borne spores--rust, mildew, head scab, and other leaf and head blights. These diseases may be brought under control by sanitation, rotation, and the use of resistant varieties.

Oats and Barley. Seed treatment with New Improved Ceresan applied at the rate of ½ ounce per bushel will control the principal seed-borne diseases, including covered smut, black loose smut, stripe disease, and the seed-borne phase of net blotch, spot blotch, fusarium seedling blight, and bacterial blight in barley, and loose and covered smuts, seed-borne leaf stripe, halo and stripe blights, and fusarium seedling blight in oats. Treatment with the fungicide also protects the seed and seedlings of both crops from certain soil-infesting fungi.

Corn. Hybrid seed corn is almost invariably treated by the seedsman before it is placed on the market. Treatment of other seed corn is recommended as a protection in the case of bad weather. Corn is subject to attack by a formidable group of seed-borne and soil-infesting fungi. If the weather after planting is cold and wet, losses of untreated seed from rot and pre-emergence damping off are likely to be severe. Fungicides protect the seed until conditions are favorable for germination. Recommended materials are Arasan, Spergon, Semesan Jr., and Barbak C, all applied at the rate of 1½ ounces per bushel.

Sorghum. Seed and seedlings can be protected from many of the same fungi that attack corn in cold, wet weather. Treatment prevents seed-rot, damping off, seedling blight, and crown rot. It controls covered kernel smut, the most widespread and destructive disease of sorghum, and the less prevalent loose kernel smut. It checks the spread of bacterial blights, downy mildew, and head smut to other areas by means of seed-borne infection. Sorghum seed may be treated with Arasan or Spergon at the rate of 1½ to 2 ounces per bushel, or with copper carbonate at the rate of 2 to 2½ ounces per bushel. New Improved Ceresan may be used at the rate of ½ ounce per bushel when the seed is treated not more than a few days before planting and is kept in a dry place. It is especially effective in preventing kernel smuts in broomcorn and other sorghums having seed with adhering chaff.

Rice. Seed treatment with Arasan at the rate of 1½ ounces per bushel, or Phygon or Spergon at the rate of 2 ounces per bushel has proved highly effective in the control of Helminthosporum seedling blight. New Improved Ceresan at the rate of ½ ounce per bushel, Dow 9B at the rate of 2 ounces per bushel, or Cuprocide at the rate of 1 ounce per bushel will also control the disease. These fungicides also combat several other fungi which injure the seed and seedlings and cause poor stands.

EFFECT ON STORED SEED

Fungicides protect stored seed from insects and rodents. Tests show that fungicides applied at half the rate recommended have produced from 90 to 100 percent disease control. Reduced dosages of volatile organic mercury dusts, such as New Improved Ceresan, are more effective against seed-borne diseases when applied several weeks or longer before the seed is sown. Long storage in this case, however, is not advised because much of the protective volatile matter is given off during storage. Non-volatile types of dusts do not affect seed in storage even when applied a year before sowing.